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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,607	06/27/2003	Yi-Chang Tsao	B-5136 621042-5	8174

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EXAMINER	
GABOR, OTILIA	
ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,607	TSAO ET AL.	
	Examiner	Art Unit	
	Otilia Gabor	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003 and 13 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

1. The amendment filed 06/13/2005 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 5, 7, 8 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Wack et al. (U. S. Patent 6,818,459 B2).

Wack et al. discloses an apparatus and method whereby the surface of a specimen (10, 278) is inspected to determine one or more of its characteristics such as the presence of defects on the specimen or a critical dimension of a feature of the specimen, where the specimen could be any known specimen, and exemplarily a specimen such as a polysilicon film on a glass substrate (see Col.35, lines 36-67), in which case, the critical dimension of a feature would be the crystal size which determines the quality of the film. The apparatus comprises:

- a probe light beam (laser source 282) having a predetermined wavelength (see Col.43, lines 12-30, Fig.24) for irradiating a polysilicon layer (278) formed on a substrate (280)

- a beam splitter (286) for receiving the probe light beam to separate it into a first light beam and a second light beam which is used to irradiate the polysilicon layer (278)
- a first detecting device (283) for detecting the light intensity of the first light beam
- a second detecting device (292) for detecting the light intensity of the second light beam reflected from the polysilicon layer (278) (see Fig.24, Col.115, line 47-Col.117, line 40).

Regarding claim 7 Wack discloses that the wavelength of the beam used is determined according to what characteristic of the specimen is measured, but that the light source can emit light in the visible and UV range, which includes the claimed range of about 300 nm (see Col.43, lines 12-30).

Regarding claim 8 Wack discloses that the polysilicon layer is positioned on a substrate that can be glass (see Col.35, lines 47-48).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4, 6, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wack and further in view of Gaynor (U. S. Patent 5,229,832) and Ozaki et al. (U. S. Patent 5,754,289).

Wack discloses that the system includes a processor (296) that processes the intensity signals from both detectors (292, 283) and based on the detected signals determines and monitors the characteristics of the specimen (278), however he fails to disclose that this monitoring is based on the intensity ratio of the detected signals from the two detectors. However, monitoring of the specimen based on the intensity ratio of the two detected intensity signals is an obvious feature of the Wack system because, as clearly shown by Gaynor, the intensity detected form the light source is mainly used to detect whether there is a fluctuation in the intensity of the light source and if such a fluctuation is present to eliminate its effect form the overall final measurement. To eliminate this effect the processor compensates the detected intensity from the specimen based on the fluctuation in the source intensity, which is done by taking a ratio of the two intensities.

Regarding claims 2, 3 Wack discloses the claimed substrate and wavelength as shown in the abovementioned paragraphs.

Regarding claims 4 and 9 Wack discloses that the beam splitter splits the light from the light source into two light beams but he fails to limit the split ratio to the one claimed. However, since he does not limit the ratio it would have been obvious to use the claimed split ratio, since as shown Gaynor when light source output is monitored the beam splitter splits the light so that a lesser intensity ratio is sent to the source output detector and a higher intensity ratio is sent to the sample, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955)).

7. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wack, Gaynor and Ozaki and further in view of Yamazaki et al. (U. S. Patent 6,730,550 B1)

Wack discloses that his apparatus and method can be used to inspect the surface of a polysilicon layer (specimen) and, as shown in embodiment of Fig.17, to use the information from the inspection of one specimen in controlling the quality and characteristics of the polysilicon layer of another second specimen during fabrication. Wack in view of Gaynor and Ozaki discloses the claimed monitoring and inspection of the specimen by the use of the intensity ratios of the detected light beams (as disclosed in the abovementioned paragraphs), but he fails to disclose the annealing process whereby the polysilicon regions are formed in the first specimen substrate. However, it

would have been obvious to one having ordinary skill in the art at the time the invention was made to use the annealing process of Yamazaki et al. to form the polysilicon layer in the Wack specimen, since as disclosed by Yamazaki, annealing polysilicon regions into a silicon substrate using laser beams is a well-known, cheap, fast and conventionally used method in this field (see Col.1, lines 32-55). The annealing process in Yamazaki is done by irradiating the amorphous silicon layer with an excimer laser beam of different predetermined energy densities to form the plurality of polysilicon regions therein.

Regarding claim 11 Yamazaki as well as Wack discloses that the substrate is glass.

Regarding claims 12, 13 Yamazaki discloses that the laser source is an excimer laser with energy density about 100-500 mJ/cm^2 (see Col.11, lines 47-52).

The subject matter of claims 14-15 was discussed in detail in the abovementioned paragraphs.

Regarding claim 16 Wack in view of Gaynor and Ozaki discloses that the energy density is changed based on the calculated ratio of intensities (eliminate the laser fluctuation effect), which energy density is obviously used in the process of controlling the quality of the second specimen, but he fails to disclose that this energy is the one which can from the largest grain size. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the energy density that gives the largest grain size, since it is well known in the art that larger grain size means better quality, and that the goal of the annealing process is to obtain the

largest grain size possible and for that, as clearly shown by Yamazaki (abstract), the laser beam with which the annealing is done is specifically chosen so as to give the largest grain size possible.

Response to Arguments

8. Applicant's arguments filed 06/13/2005 have been fully considered but they are not persuasive. The argument presented by the Applicant that the reference Wack, though discloses detecting the output power of the light source, it nevertheless fails to disclose detecting the claimed light intensity, is not persuasive because Wack discloses not only power but also light intensity detection (see detector arrangement of Fig.11A, where element 110 detects intensity of the light source). The argument that the references fail to disclose use of the ratio of the detected intensities, even though they explicitly disclose use of the difference between the detected intensities, is not persuasive because it is well known in the art to substitute one for the other.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 571-272-2435. The examiner can normally be reached on Monday, Thursday-Friday between 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Otilia Gabor
Primary Examiner
Art Unit 2878

OTILIA GABOR
PRIMARY EXAMINER